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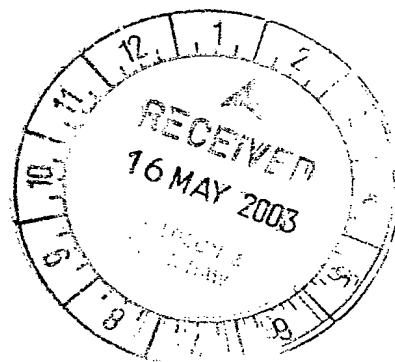
Your Ref : 1012201 PAT/Densa/ELK1LS

Our Ref : 200203488-2

Date : 12/05/03

Writer's Direct Line : 6330 2748

M/s Donaldson & Burkinshaw  
P O Box 3667  
Singapore 905667



Dear Sirs,

Invitation To Respond To A Written Opinion	
Application No:	200203488-2
Applicant:	Densa Corp.
Request Filed On:	13/06/02

Attached is a copy of written opinion drawn up by the Examiner in connection with the request made for:



Search and Examination Report; or




Examination Report

You are invited to respond to this opinion by submitting:

- (a) written arguments disagreeing with the Examiner's opinion, and/or
- (b) an amendment of the specification of the application.

If you intend to respond, the response must be filed within 5 months from the date of this letter. You are also advised to let us know early by completing Part II of this letter if you intend not to respond.

The examiner will proceed to establish the examination report at the expiration of the allowed period when no response is received.

  
Annie Basant d/o Surendran (Madam)  
for Registrar of Patents  
Singapore

Part II

We refer to the above invitation. We do not wish to respond to this written opinion and please inform the IP, Australia / Austrian Patent Office \*\* accordingly.

Date  
\*\* delete as appropriate

\_\_\_\_\_  
Name of Agent

# AUSTRALIAN PATENT OFFICE

## SEARCH REPORT

Applicant's or agent's file reference <b>1012201PAT/DENSO/ELK/LS</b>		
Application No. <b>SG 200203488-2</b>	Application Filing Date ( <i>day/month/year</i> ) <b>13 June 2002</b>	(Earliest) Priority Date ( <i>day/month/year</i> ) <b>13 June 2001</b>
Applicant <b>DENSO CORPORATION</b>		

This search report consists of a total of **5** sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. ☐ Certain claims were found unsearchable (See Box I)
2. ☐ Unity of invention is lacking (See Box II)
3. ☐ The application contains disclosure of a nucleotide and/or amino acid sequence listing and the search was carried out on the basis of the sequence listing
 

☐ filed with the application  
☐ furnished by the applicant separately from the application,  
☐ but not accompanied by a statement to the effect that it did not include matter going beyond the disclosure in application as filed

サーチレポート

4. With regard to the title, ☐ the text is approved as submitted by the applicant.  
☒ the text has been established by this Office to read as follows:

**PRINTED WIRING BOARD WITH EMBEDDED ELECTRIC DEVICE AND ITS METHOD OF MANUFACTURE**

5. With regard to the abstract, ☐ the text is approved as submitted by the applicant  
☒ the text has been established by this Office as it appears in Box III

6. The figure of the drawings to be published with the abstract is Figure No. **1E**

☐ as suggested by the applicant.  
☒ because the applicant failed to suggest a figure  
☐ because this figure better characterises the invention  
☐ None of the figures

**Box III TEXT OF THE ABSTRACT (Continuation of item 5 of the first sheet)**

A printed wiring board having an embedded electric device is manufactured as follows. A first resin film having an opening (36) or a sheet member having a recess is piled with a plurality of second resin films, on which a plurality of conductive layers (22) are formed. The first and second resin films and the sheet member include thermoplastic resin. An electric device (41) is inserted in the opening or the recess. Then, the piled body including the electric device is pressed and heated to integrate the piled body. When the piled body is pressed and heated, a plurality of electrodes (42) of the electric device are electrically connected to the conductive layers while the first and second resin films and the sheet member are plastically deformed to seal the electric device.

# AUSTRALIAN PATENT OFFICE

## SEARCH REPORT

Application No.

SG 200203488-2

### A. CLASSIFICATION OF SUBJECT MATTER

According to International Patent Classification (IPC)

Int. Cl. <sup>7</sup> H05K 3/46, 1/16

### B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the search (name of data base and, where practicable, search terms used)

DWPI IPC H05K & keywords: PCB, PWB, PWA, multiple, second, layer, films, lamina, stack, sandwich, strata, sheets, pile, opening, via, recess, hole, cavity, space, gap, heat bond, heat press, cure, embed, component, chip, conductor, resistor, locate, position, align

### C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
E, X	US 6469374 B1 (IMOTO) 22 October 2002 See whole document	1-5, 9, 10, 12-19, 21-30
P, X	US 6292366 B1 (PLATT) 18 September 2001 See whole document	1, 2, 4-7, 9, 14, 17-30
X	JP 4356998 A (IBIDEN CO LTD) 10 December 1992 and ESPACE Abstract JP 4356998 A See abstract and figures	1-30



Further documents are listed in the continuation of Box C



See patent family annex

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier application or patent but published on or after the international filing date	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&" document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of submission of the request to the Australian Patent Office

2 December 2002

Date of completion of the search report

1 April 2003

Date of mailing of the search report

08 APR 2003

Name and mailing address

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PO BOX 200, WODEN ACT 2606, AUSTRALIA  
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Facsimile No. 61 2 62853929

Authorised officer

DEREK BUTLER

**AUSTRALIAN PATENT OFFICE**

**SEARCH REPORT**

**Application No.**

**SG 200203488-2**

<b>C (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
<b>Category*</b>	<b>Citation of document, with indication, where appropriate, of the relevant passages</b>	<b>Relevant to claim No.</b>
X	US 6239496 B1 (ASADA) 29 May 2001 See whole document	1, 2, 4, 5, 9-12, 14, 17-23, 26-30
X	JP 11312868 A (KYOCERA CORP) 9 November 1999 and ESPACE Abstract JP 11312868 A See abstract and figures	1-5, 9-30
X	JP 11145381 A (DENSO CORP) 28 May 1999 See abstract and figures	14, 15, 17-30
X	US 6180881 B1 (ISAAK) 30 January 2001 See whole document	23-30

**AUSTRALIAN PATENT OFFICE**

**SEARCH REPORT**

**PATENT FAMILY MEMBERS**

**Application No.**

**SG 200203488-2**

Patent Document Cited in Search Report		Patent Family Member			
US	6469374	JP	2001068624		
US	6292366	NONE			
JP	4356998	NONE			
US	6239496	JP	2000208698	KR	2000053511
		US	6413798	US	2001012643
JP	11312868	NONE			
JP	11145381	NONE			
US	6180881	AU	24752/99	CA	2318904
		US	5995046	US	6121926
		WO	9939219	US	5920287
		AU	200161067	WO	200182520
		US	2002039080	US	2001030625
END OF ANNEX					

# AUSTRALIAN PATENT OFFICE

## WRITTEN OPINION

		Date of mailing <i>day/month/year</i> <b>08 APR 2003</b>	
Applicant's or agent's file reference <b>1012201PAT/DENSO/ELK/LS</b>		<b>REPLY DUE</b> within FIVE MONTHS of the date of the Registrar's letter enclosing the written opinion	
Application No. <b>SG 200203488-2</b>	Application Filing Date ( <i>day/month/year</i> ) <b>13 June 2002</b>	Priority Date ( <i>day/month/year</i> ) <b>13 June 2001</b>	
International Patent Classification (IPC) (as indicated in the search report) <b>Int. Cl. 7    H05K 3/46, 1/16</b>			
Applicant <b>DENSO CORPORATION</b>			

1. This First written opinion consists of a total of 5 sheets.	
2. This opinion contains indications relating to the following items:	
I	<input checked="" type="checkbox"/> Basis of the opinion
II	<input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
III	<input type="checkbox"/> Lack of unity of invention
IV	<input checked="" type="checkbox"/> Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
V	<input type="checkbox"/> Certain documents cited
VI	<input type="checkbox"/> Certain defects in the application
VII	<input checked="" type="checkbox"/> Certain observations on the application
3. This opinion is based upon the assumption that the priority claim is valid.	
4. The search report used was issued by the <b>Australian Patent Office</b> , and the date of completion is: <b>1 April 2003</b>	
5. If no reply is filed, the examination report will be established on the basis of this opinion.	
6. The date by which the examination report will be established is: <b>13 September 2005</b>	

Name and mailing address AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: <a href="mailto:pct@ipaaustralia.gov.au">pct@ipaaustralia.gov.au</a> Facsimile no. 61 2 62853929	Authorized Officer  <b>DEREK BUTLER</b>
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**I. Basis of the opinion**

1. This opinion has been drawn on the basis of:

☒ the application as originally filed.

☐ the description, pages , as originally filed,  
pages , filed with the request,  
pages , received on with the letter of

☐ the claims, pages , as originally filed,  
pages , filed with the request,  
pages , received on with the letter of

☐ the drawings, sheets/fig. , as originally filed,  
sheets/fig. , filed with the request,  
sheets/fig. , received on with the letters of

☐ the sequence listing part of the description:  
pages , as originally filed  
pages , filed with the demand  
pages , received on with the letter of

2. The amendments have resulted in the cancellation of: pages:  
sheets of drawings/figures No :

3. ☐ This opinion has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box.

4. Additional observations, if necessary:



**IV. Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement****1. Statement**

Novelty (N)	Claims 11-13,20-22, 26	YES
	Claims 1-10, 14-19, 23-25, 27-30	NO
Inventive step (IS)	Claims -	YES
	Claims 1-30	NO
Industrial applicability (IA)	Claims 1-30	YES
	Claims -	NO

**2. Citations and explanations**

The following documents identified in the Search Report have been considered for the purposes of this report:

- D1 JP 4356998 A (IBIDEN CO LTD) 10 December 1992  
D2 US 6239496 B1 (ASADA) 29 May 2001  
D3 JP 11312868 A (KYOCERA CORP) 9 November 1999  
D4 JP 11145381 A (DENSO CORP) 28 May 1999  
D5 US 6180881 B1 (ISAAK) 30 January 2001

**NOVELTY (N) claims 1-10, 14-19, 23-25, 27-30**

Citations D1, D2 and D3 disclose all the essential features of the invention as defined at least in independent claims 1, 14 and 23. Citation D4 discloses all the essential features of the invention as defined at least in independent claims 14 and 23. Citation D5 discloses all the essential features of the invention as defined at least in independent claim 23. The additional features defined in dependent claims 2-10, 15-19, 24, 25 and 27-30 are also disclosed explicitly or implicitly in the citations.

For example admitted prior art D3 discloses a method of manufacturing a printed wiring board including forming an opening 6 in a first resin board 3b, stacking it with a plurality of other boards 3a, 3c, 3d, inserting electric device 8 substantially the size of the opening in the opening and bonding the stack together.

Consequently the subject matter of claims 1-10, 14-19, 23-25 and 27-30 is not new and does not meet the requirements of Section 14 of the Act with regard to novelty.

**INVENTIVE STEP (IS) claims 1-30**

Claims 1-10, 14-19, 23-25, 27-30 see novelty comments above.

Appended claims 11-13, 20-22 and 26 relate to parameters or structures which can be arrived at by the application of normal design procedures when the general technical knowledge about the state of the art is used and hence do not contribute to patentable invention.

Consequently the subject matter of claims 1-30 is obvious and does not meet the requirements of Section 15 of the Act with regard to inventive step.

**VII. Certain observations on the application**

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

- ☒ The claimed invention is patentable according to Section 13(2); or
- ☐ The claimed invention is unpatentable according to Section 13(2) because:

**Supplemental Box**

(To be used when the space in any of Boxes I to VII is not sufficient)

**Continuation of Box No. IV:** Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

**INDUSTRIAL APPLICABILITY (IA) claims 1-30**

The invention as defined in the claims is capable of industrial application and meets the requirements of Section 16 of the Act.